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527 CMR 31.00: Carbon Monoxide Alarms

Section

31.01: Purpose and Scope

The purpose of 527 CMR 31 is to provide minimum requirements for the type, installation, location, maintenance, and inspection of carbon monoxide alarms in every dwelling, building or structure in accordance with the provisions of MGL 148 Section 26F$^{1/2}$. These regulations shall apply to every dwelling, building or structure including those owned and operated by the Commonwealth, occupied in whole or in part for residential purposes, that:

(a) contains fossil-fuel burning equipment or
(b) incorporates enclosed parking within its structure.

31.02: Definitions

As used in 527 CMR 31.00, the following definitions shall have the meanings respectively assigned to them:

Adjacent Spaces: shall mean any area, space, room or dwelling unit located directly next to, below or above any area space, room or dwelling unit that contains fossil fuel burning equipment or enclosed parking. It shall not include closets, bathrooms, cabinets or similar areas used for storage or utility purposes and temporarily occupied for activities relating to such storage or utility use.

Centralized Fossil Fuel Burning Equipment: shall mean a central heating plant, hot water heater, a combustion driven generator or fire pump, central laundry equipment, or similar equipment that emits carbon monoxide as a by-product of combustion and does not allow for air exchange between Centralized Fossil Fuel Burning Equipment and Dwelling Units or common areas.

Carbon Monoxide Alarm Protection: shall mean carbon monoxide alarm protection that may consist of either:

(a) battery powered in compliance with NFPA 720, 5.2.3 and wireless appliances, or
(b) ac (alternating current) plug-in with battery back up in accordance with NFPA 720, 5.2.2.6, or
(c) ac primary power source with battery back up in compliance with NFPA 720, 5.2.2, or
(d) low voltage or wireless systems with secondary power in compliance with NFPA 720, 5.2.4 , or
(e) Combination Appliance.

At a minimum, all such Carbon Monoxide Alarm Protection equipment shall operate as a Single Station Alarm Device or Single Station Carbon Monoxide Alarm.

Combination Appliance: shall mean a combination photoelectric smoke detector and carbon monoxide alarm which may be battery or ac (alternating current) powered with battery back up. A combination ionization detector and carbon monoxide alarm which may be battery or ac (alternating current) powered, with battery back up, may be utilized if it is installed not less than 20 ft. from any bathroom or kitchen entryway. Such Combination Appliances shall employ both simulated voice and tone alarm features which clearly distinguishes between carbon monoxide and smoke notification, in accordance with NFPA 720, 5.3.4.

Daycare Facility: A facility licensed by the Commonwealth under MGL 28A or its successor statues or regulations by the Department of Early Education and Care as a Child Care Center, School Aged Child Care Program, or Family Child Care Home, including Large Family Child Care and Family Child Care Plus.

Dwelling Unit: A single unit providing facilities for living and sleeping.

Enclosed Parking: A structure or an area or room, or floor or level thereof, enclosed within an overall structure or attached thereto that is designed or used for the parking of vehicles and does not comply with the minimum exterior wall opening requirements of an "Open Parking Structure" as stated in 780 CMR 406.1.1, State Building Code.

Fossil Fuel Burning Equipment: Any device, apparatus or appliance which is designed or used to consume fuel of any kind which emits carbon monoxide as a by-product of combustion.

Habitable: shall mean that portion of a cellar, basement or attic that is designed, used or furnished for living purposes.

Head of the Fire Department: Shall mean the head of the Fire Department as defined in M.G.L. c. 148, s. 1, or a designee of the head of the Fire Department.

Intermittent Ignition Device: A device which ignites an automatic gas appliance to begin normal operation thereof, and which is activated only at the time such automatic gas appliance is to be so ignited.

Institutional Structures: shall include any dwelling, building or structure classified as use group I-1 through I-3, as defined in 780 CMR and those unclassified occupancies that have the same characteristics as I-1 through I-3. Where there is a dispute regarding Use Group classification of a structure, a determination shall be made by the municipal or state building inspector having jurisdiction.

Listed: A device listed by a Nationally Recognized Testing Laboratory meeting the requirements of 527 CMR 49.03 Appendix C and the standards in either IAS/CSA 6.19 or UL 2034 –Single and Multiple Station Carbon Monoxide Alarms, June 2002 Edition or UL 2075 –Gas and Vapor Detector Sensor, November 2004 Edition, as applicable for the installation.

Marshal: shall mean the State Fire Marshal or a designee of the State Fire Marshal.

NFPA 720: shall mean National Fire Protection Association (NFPA) 720 entitled "Standard for the Installation of Carbon (CO) warning Equipment in Dwelling Units", 2005 Edition.

Residential Structures: shall include any dwelling, building or structure classified as use group R-1 with less than six dwelling units or R-2 through R-5, as defined in 780 CMR and those unclassified occupancies that have the same characteristics as a R-1 with less than six dwelling units or R-2 through R-5. Where there is a dispute regarding Use Group classification of a structure, a determination shall be made by the municipal or state building inspector having jurisdiction.

Roof Mounted Fossil Fuel Burning Equipment :Any Fossil Fuel Burning Equipment mounted on top of a structure that is used to condition any medium through heating or cooling.

Single Station Alarm Device: An assembly that incorporates the detector, the control equipment, and the alarm-sounding device in one unit operated from a power source either located in the unit or obtained at the point of installation.

Single Station Carbon Monoxide Alarm: A detector comprising an assembly that incorporates a sensor, control components, and an alarm notification appliance in one unit operated from a power source either located in the unit or obtained at the point of installation.

State Building Code: 780 CMR, Massachusetts State Building Code, (6th Edition).

Transient Residential Structures: shall include any dwelling, building or structure classified as use group R-1 with six or more dwelling units, as defined in 780 CMR and those unclassified occupancies that have the same characteristics as R-1 with six or more dwelling units. Where there is a dispute regarding Use Group classification of a structure, a determination shall be made by the municipal or state building inspector having jurisdiction.

U.L. 2075: shall mean Underwriters Laboratory standard 2075 entitled "Standard for Gas and Vapor Detector Sensors", November, 2004 Edition.

31.03: General Installation Provisions

1. Any carbon monoxide alarm using an ac (alternating current) primary power source and any other wired carbon monoxide alarm protection equipment shall be installed and maintained in accordance with the Massachusetts Electrical Code, 527 CMR 12 and in accordance with M.G.L. c. 143, s.3L and MGL 141, s. 1A, if applicable.

2. Buildings or structures owned or operated by the Commonwealth or any local housing authority are exempt from the requirements of 527 CMR 31.04 until January 1, 2008.

3. Buildings or structures constructed, renovated or subject to a change in use for which building permits have been issued on or after March 31, 2006, shall comply with any stricter carbon monoxide alarm requirements of The State Building Code, if applicable.

4. The installation of carbon monoxide detectors in accordance with 527 CMR 30, relating to certain Unvented Propane or Natural Gas-Fired Space Heaters, if applicable, shall satisfy the requirements of 527 CMR 31.00 for that level on which such heater is located, provided the installation complies with 527 CMR 31.04(1) (a)and (b).

5. The installation of carbon monoxide detectors in accordance with 248 CMR, The Commonwealth of Massachusetts Fuel Gas and Plumbing Code, if applicable, shall satisfy the requirements of 527 CMR 31.00 for that level on which the direct vented gas appliance is located, provided the installation complies with 527 CMR 31.04(1) (a)and(b).

6. Effective December 1, 2006 a permit shall be obtained from the Head of the Fire Department for all installations which employ one or more of the Carbon Monoxide Alarm protection options listed in 527 CMR 31.05. The Marshal shall prescribe a uniform application form for such permit.

31.04 Specific Installation Provisions

1. Residential Structures: Effective March 31, 2006 every Residential Structure that presently or in the future contains Fossil Fuel Burning Equipment or has enclosed parking shall be equipped, by the owner, landlord or superintendent, with working and Listed Carbon Monoxide Alarm Protection.

(a) Carbon Monoxide Alarm Protection shall be located in each level of each Dwelling Unit including Habitable portions of basements, cellars and attics, but not including crawl spaces. The installation of said unit shall be located in accordance with the manufacturer's instructions.

(b) When mounting Carbon Monoxide Alarm Protection on a level of a Dwelling Unit with a sleeping area, the alarm shall be installed in the immediate vicinity of the sleeping

area. At a minimum, the alarm shall be located outside of any bedroom, but shall not exceed 10 ft. as measured in any direction from any bedroom door.

(c) Alternative Compliance Options: Such Residential Structures, as an alternative to providing Carbon Monoxide Alarm Protection within each level of each Dwelling Unit, may be protected by using one or more of the Carbon Monoxide Protection Technical Options stated in 527 CMR 31.05 1. (a) through (g) if applicable. However, notwithstanding the use of any Alternative Compliance Option, Carbon Monoxide Alarm Protection shall also be installed in any Dwelling Unit that contains Fossil Fuel Burning Equipment in accordance with 527 CMR 31.04(1)(a) and (b).

(d) Alternative compliance deadline for certain installations
Any owner who intends to meet the requirements of 527 CMR 31.04 by installing either: (1) ac (alternating current) primary power source with battery back up or wired, low voltage, carbon monoxide alarm protection or (2) an Alternative Compliance Option of 527 CMR 31.04 (1)(c), shall not be required to complete such installation until 1-1-07 if said owner provides written notification of such intent to the head of the fire department by 5-15-06. The submission of such notification shall be deemed to be the consent by the owner to the future inspection of the subject building by the head of the fire department to determine compliance. Installation of carbon monoxide alarm protection pursuant to 527 CMR 31.04(1)(d) may be allowed notwithstanding the late filing of the written notification, only upon the approval of the head of the fire department who may require temporary carbon monoxide alarm protection pending the completion of installation.

2. Other Transient Residential and Institutional Structures Required to have Hard-Wired Carbon Monoxide Alarm Protection by January 1, 2008.

(a) Effective January 1, 2008 every Transient Residential and Institutional Structure that presently or in the future contains Fossil Fuel Burning Equipment or has enclosed parking shall be equipped, by the owner, landlord or superintendent, with working and Listed Carbon Monoxide Alarm Protection as defined in 527 CMR 31.02 with the exception of option (a), (b) and (e) if battery powered, in each level of each dwelling unit.

(b) Alternative Compliance Option: Such Transient Residential and Institutional Structures, as an alternative to providing Carbon Monoxide Alarm Protection within each level of each Dwelling Unit, may be protected by using one or more of the Carbon Monoxide Protection Technical Options stated in 527 CMR 31.05 1. (a) through (h) However, notwithstanding the use of any Alternative Compliance Option allowed under 527 CMR 31.04 2. (b), Carbon Monoxide Alarm Protection shall also be installed in any Dwelling Unit that contains Fossil Fuel Burning Equipment in accordance with 527 CMR 31.04(2)(a).

3. Day Care Facilities:

A Day Care Facility classified as either a Child Care Center, School Aged Child Care Program, Family Child Care Home, including Large Family Child Care and Family Child Care Plus by the Department of Early Education and Care shall comply with the following, as applicable:

(a) Family Child Care Home, including Large Family Child Care and Family Child Care Plus facilities shall comply with 527 CMR 31.04 (1) (a) and (b).

(b) Group Child Care and School Aged Child Care Program facilities shall install Carbon Monoxide Alarm Protection with Listed Carbon Monoxide Alarm Protection, as defined in 527 CMR 31.02, with the exception of option (a) and (e) if battery Powered, in each room used by children for sleeping, learning, or participating in other early education and care activities.

4. Roof Mounted Fossil Fuel Burning Equipment:

(a) All Residential Structures, Transient Residential Structures or Institutional Structures that presently or in the future employ Roof Mounted Fossil Fuel Burning Equipment that directly supplies air to dwelling units shall be equipped with Carbon Monoxide Alarm Protection as provided in 527 CMR 31.04 1. (a) and (b) or 527 CMR 31.04 2. (a), as applicable.

(b)All Residential Structures, Transient Residential Structures or Institutional Structures that presently or in the future employ Roof Mounted Fossil Fuel Burning Equipment that directly supplies air to common areas and not to dwelling units shall be equipped with Carbon Monoxide Alarm Protection as provided in 527 CMR 31.04 1. (a) and (b) or 527 CMR 31.04 2. (a), as applicable or employ Type F Carbon monoxide protection as provided in 527 CMR 31.05 1. (f).

(c)All Residential Structures, Transient Residential Structures or Institutional Structures that presently or in the future employ Roof Mounted Fossil Fuel Burning Equipment that does not

directly supply air to dwelling units or common areas: Reserved

31.05 Carbon Monoxide Protection: Technical Options

1. Certain Residential Structures, Transient Residential Structures or Institutional Structures may present Carbon Monoxide risks in a limited or minimum portion of the structure rather than in each Dwelling Unit. The following technical options employ methods which may make it unnecessary to install Carbon Monoxide Alarm Protection in each level of each dwelling unit in accordance with 527 CMR 31.04 1. (a) and (b) or 527 CMR 31.04 2. (a), as applicable. Not withstanding the utilization of any technical option, or combination thereof, Carbon Monoxide Alarm Protection shall also be installed in any Dwelling Unit that contains Fossil Fuel Burning Equipment in accordance with 527 CMR 31.04(1)(a) and (b) or 527 CMR 31.04 (2) (a).

(a) **Type A Carbon Monoxide protection for areas or rooms containing Centralized Fossil Fuel Burning Equipment,** shall employ **Listed** Carbon Monoxide Alarm Protection meeting UL 2075, or a low voltage or wireless system. Such installation shall provide a visual or audible alarm in the rooms or areas containing the Fossil Fuel Burning Equipment. Such installation shall be in accordance with the manufacturer's instructions. Such protection shall be monitored in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner. In accordance with NFPA 720, 5.3.9.3 (1) the retransmission of the signal shall be at the discretion of the head of the fire department.

(b) Type B Carbon Monoxide protection for areas or rooms of Centralized Fossil Fuel Burning Equipment consisting of kitchen appliances equipped with an Intermittent Ignition Device, shall comply with 248 CMR Fuel/Gas Plumbing Code and the 2002 Edition of NFPA 54 sections 10.3.4.5 or 10.3.5.2. A written certification shall be submitted to the Head of the Fire Department from a Registered Professional Engineer licensed by the Commonwealth certifying that the kitchen appliances meet 248 CMR and said NFPA 54.

(c) Type C Carbon Monoxide protection for areas or rooms with Centralized Fossil Fuel Burning Equipment which employ an automatic integrated shutdown device which shall be directly connected to the fossil fuel burning equipment and an ac primary power source with battery back up in compliance with NFPA 720, 5.2.2 or low voltage or wireless systems in compliance with NFPA 720, 5.2.4 that will cause a shut down to the fossil fuel burning equipment upon activation of a carbon monoxide detector. The device must also provide an audible or visual alarm in the immediate area of the device and fossil fuel burning equipment.

The fossil fuel burning equipment must be manually restarted after activation. A sign shall be mounted in the vicinity of the device with a minimum of 1 inch high letters in contrasting color with the following statement: "If the carbon monoxide detector has activated, do not restart the equipment until serviced by a qualified technician**".**

Exception: Such shut down requirement shall not be applicable to systems that are part of an emergency or standby system required by any municipal, state or federal law or *regulation* ***provided the Carbon Monoxide detection system shall be monitored in accordance with NFPA 720 5.3.9.***

(d) Type D Carbon Monoxide protection for adjacent spaces of structures, areas or rooms considered Enclosed Parking, shall employ Listed Carbon Monoxide Alarm Protection meeting UL 2075 or a low voltage or wireless system. Such installation shall provide a visual or audible alarm in the rooms or areas containing the Fossil Fuel Burning Equipment. Such protection shall be monitored in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner. In accordance with NFPA 720, 5.3.9.3 (1) the retransmission of the signal shall be at the discretion of the head of the fire department.

(e) Type E Carbon Monoxide protection for Enclosed Parking, shall employ, in the enclosed parking either: i.) an automatic mechanical ventilation system that automatically operates upon detection of carbon monoxide in accordance with 780 CMR 2801.2, without exception or reduction, and provides for a supervisory alarm at 50 ppm in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner in accordance with NFPA 720, 5.3.9.3 (1), and the retransmission of the signal shall be at the discretion of the head of the fire department; or ii.) The enclosed parking has continuous mechanical ventilation at a minimum rate in accordance with 780 CMR 2801.2, without exception or reduction**.** Such system shall employ a sensor to ensure the minimum airflow as designed is operating through the system. The sensor shall monitor direct airflow and shall be connected to the fire alarm panel as a supervisory alarm in accordance with NFPA 720, 5.3.9. A registered Professional Engineer licensed by the Commonwealth shall provide written certification to the head of the fire department that the subject enclosed parking meets the requirements of 527 CMR 31.05 1(e).

(f) Type F Carbon Monoxide protection for Roof Mounted Fossil Fuel Burning Equipment that circulate air from said unit to common areas only, shall be equipped with the following:

i. A duct Carbon Monoxide gas detection device shall be installed on the supply side of the Roof Mounted Air Handling Unit or the common areas on the floor closest to the initial supply discharge from the Roof Mounted Air Handling Unit. All such devices shall be installed in accordance with the manufacturer's instructions. The Carbon Monoxide gas detection device shall automatically alarm upon detection of carbon monoxide at 50 parts per million (ppm) and provide for a supervisory alarm in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner in accordance with NFPA 720, 5.3.9.3 (1), and the retransmission of the signal shall be at the discretion of the head of the fire department. Upon activation of the Carbon Monoxide detection device and supervisory alarm, the roof mounted fossil fuel burning equipment shall shutdown until manually reset.

Exception: Such shut down requirement shall not be applicable to systems that are part of an emergency or standby system required by any municipal, state or federal law or regulation.

(g) Type **G** **Carbon Monoxide protection for Roof Mounted Fossil Fuel Burning Equipment that do not circulate air to any common area or dwelling unit**, shall be equipped with the following: Reserved

(h) Type H. Carbon Monoxide protection for certain Institutional structures that contain Fossil Fuel Burning equipment that circulates air to patient rooms, inmate rooms or common areas. Carbon Monoxide protection for certain Institutional structures classified as either Use Group I-2 or I-3, that contain Fossil Fuel Burning equipment that circulates air to dwelling units occupied by patients or inmates may be equipped with type H protection if the following conditions are met:

a. Such structure contains dwelling units occupied by a person or persons who are not capable of self preservation due to age, mental disability, medical condition, incarceration, restraint or security, and

b. the occupants are under constant supervision on a 24 hour basis.

Type H protection shall include a duct Carbon Monoxide gas detection device which shall be installed downstream of air filters, ahead of any branch connections in air supply systems of the fossil fuel Air Handling Unit. All such devices shall be installed in accordance with the manufacturer's instructions. The Carbon Monoxide gas detection device shall automatically alarm upon detection of carbon monoxide at 50 parts per million (ppm) and provide for a supervisory alarm in accordance with NFPA 720, 5.3.9. Such method of monitoring is to be determined at the discretion of the building owner in accordance with NFPA 720, 5.3.9.3 (1), and the retransmission of the signal shall be at the discretion of the head of the fire department. Upon activation of the Carbon Monoxide detection device and supervisory alarm, the fossil fuel burning equipment shall shutdown until manually reset.

Exception: Such shut down requirement shall not be applicable to systems that are part of an emergency or standby system required by any municipal, state or federal law or regulation.

31.06: Inspection and Maintenance Requirements

1. The head of the fire department or designee shall enforce the provisions of 527 CMR 31.00, including the inspection for conformance with the carbon monoxide alarm requirements, upon sale or transfer of such dwelling, building or structure used in whole or in part for residential purposes.

31.07 Landlord Installation, Inspection and Maintenance Duties

1. Every owner, superintendent, or landlord shall, at a minimum, maintain, test, repair, or replace, if necessary, every carbon monoxide alarm upon renewal of any lease term for any dwelling unit or on an annual basis, whichever is more frequent. All common areas shall be inspected annually. All carbon monoxide alarm batteries shall be replaced, on an annual basis by the owner, landlord or superintendent.

   Exception: Low voltage system batteries shall be maintained in accordance with applicable sections of NFPA 720.

2. The owner, superintendent, or landlord of every structure that employs one or more of the Carbon Monoxide Protection Technical Options listed in 527 CMR 31.05 shall be responsible for the care and maintenance of such equipment and devices. Annually, the owner, superintendent or landlord of every structure shall submit to the head of the fire department a record of inspection, maintenance and testing on a form prescribed by the Marshal. Carbon monoxide systems shall not be disconnected or otherwise rendered unserviceable without first notifying the fire department in accordance with MGL 148 s. 27A.

31.08 Carbon Monoxide Alarms Installed in Dwelling Units Inhabited by Persons Who are Hearing Impaired

Every owner, superintendent, or landlord having control of any dwelling unit inhabited by a person who is hearing impaired, shall comply with any carbon monoxide provisions, if applicable, established by the Architectural Access Board pursuant to 521 CMR.

31.09 Emergency Planning

The owner, superintendent or landlord of every structure that employs carbon monoxide alarm protection by utilizing one or more of the Carbon Monoxide Protection Technical Options listed in 527 CMR 31.05 shall prepare a written emergency plan that is in effect and available to all personnel. The plan shall be presented to and approved by the head of the fire department. The plan shall include at a minimum:

1. An annual review by the owner, superintendent or landlord of the plan with all employees who shall be kept informed in respect to their duties and responsibilities under the plan;
2. The development of a policy and procedure to communicate the immediate situation to the local fire department ;
3. An evacuation plan; and
4. A list of emergency contact phone numbers of responsible parties.

REGULATORY AUTHORITY
MGL c. 148, §§ 26F$^{1/2}$, 28